CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 96-051

FINAL SITE CLEANUP REQUIREMENTS FOR:

Unocal Corporation

for the property located at

1600 Mission Street
San Francisco, CA

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter Board), finds that:

1. **Site Location**: The subject site is located at the southern corner of the intersection of Mission and Otis Streets and Van Ness Avenue in San Francisco. See location map on Plate 1. The site is a triangle shape, with a total area of approximately 1,500 square feet. The site is located in a commercial area, approximately 0.5 miles to the north of US highway 101. No surface water body is in the vicinity.

2. **Site History**: The subject site formerly contained a Unocal service station and auto care facility. See Plate 2. Three underground gasoline storage tanks (USTs) and a waste oil tank were removed from the site. Soil and ground water were found to be impacted by TPH-G and BTEX constituents. Subsequently, overexcavation removed impacted soils. Six monitoring wells were installed to assess the groundwater pollution and have been monitored quarterly since they were first installed in October 1987. The monitoring wells have shown a trend of decreasing concentrations. Since 6/24/93, TPH-G and BTEX constituent concentrations have stabilized. The hydraulic gradient appears to be well defined.

3. **Named Dischargers**: Unocal Corporation has been the sole responsible party for cleanup and monitoring events. Unocal is in the process of selling the property to a development agency.

4. **Regulatory Status**: This site is not currently under Board order.

5. **Site Hydrogeology**: The site is planar, sloping gently to the east toward Van Ness Avenue. See Figure 1. Soil beneath the site consists of dense permeable sand to a depth of at least 19 feet. Ground water was encountered at a depth of 13 feet. Ground water is interpreted to flow to the east with a gradient of 0.06 ft/ft. Hydrologically, the site is located in the Downtown Basin.

6. **Remedial Investigation**: Following the removal of the USTs, approximately 950 cubic yards of soil was excavated and disposed. Nineteen confirmation soil samples were collected and analyzed. Six additional soil borings and six hydro-punch probes were performed onsite. Three other soil borings were drilled offsite and were converted to ground water monitoring wells. It appears that the bulk of the soil contamination source has been removed. Soil sample analyses of remaining residual petroleum hydrocarbons show a maximum concentration of 1,700 ppm TPH-G and 49 ppm benzene at the capillary fringe zone.

Approximately 1,000 gallons of ground water were pumped out from the tank during removal. Maximum ground water concentrations detected are located in the crossgradient well (MW-3) at 11 ppm TPH-G and 160 ppb benzene. However, hydrocarbons have not been detected in the downgradient wells. Overall, hydrocarbon concentrations have been decreasing since the monitoring wells have been installed. See Plate 3.

7. **Adjacent Sites**: There are two adjacent sites which are known to have handled petroleum products. Each site contains one waste oil tank. These sites have not impacted the Unocal site as they are located either downgradient or crossgradient from the Unocal site. Currently, there are no active remedial actions taken at the site.

8. **Interim Remedial Measures**: No other interim remedial measures have been performed at the site, except for ground water monitoring and sampling. Unocal is planning to install oxygen releasing compound devices in two wells to enhance biodegradation of petroleum hydrocarbons in soil and ground water.

9. **Feasibility Study**: Based upon review of remedial alternatives (soil excavation, in-situ bioremediation, vapor extraction/air sparge, ground water pump and treat, and containment zone), Unocal has determined that the Board's Containment Zone management strategy is the most feasible and appropriate option for this site. Since residual soil contaminants exist at the capillary fringe and ground water concentrations have been decreasing, Unocal is proposing to continue to monitor and sample ground water monitoring wells in addition to injecting oxygen to enhance natural bio remediation.

10. **Cleanup Plan**: Based on Unocal's request dated December 4, 1995, Containment Zone is the preferred alternative for this site due to the following facts:

A) Adequate source removal has occurred. Approximately 950 yds of polluted soil was removed. Residual contaminants remaining are bound within the capillary fringe zone and do not permit cost-effective cleanup. They do not pose a threat to public health or the environment.

B) Approximately 1,000 gallons of ground water were pumped and disposed of properly. Continued ground water purging has reduced concentrations significantly.

C) The groundwater plume has stablized in terms of mass, concentration, and movement, therefore, monitoring and sampling will be continued.

D) Oxygen releasing compounds will be utilized in two monitoring wells to enhance natural biodegradation.

11. **Risk Assessment**: A qualitative health risk assessment indicated that BTEX levels provided an acceptable level of cancer risk for this site. BTEX constituents the only known carcinogens at the site. Concentrations of these constituents are low, which do not pose a significant threat to public health or the environment. There are no human drinking water wells at the site or in the vicinity. Prior to site development, prospective buyers, onsite workers, and occupants, however, must be aware of the residual hydrocarbons.

For comparison, the Board considers the following risks to be acceptable at remediation sites: a hazard index of 1.0 or less for non-carcinogens, and an excess cancer risk of 10^{-4} or less for carcinogens.

Due to possible risks that may be present at the site pending attainment cleanup standards, institutional constraints are appropriate to limit on-site exposure to acceptable levels. Institutional constraints include a deed restriction that notifies future owners of sub-surface contamination and prohibits the use of shallow groundwater beneath the site as a source of drinking water until cleanup standards are met.

12. **Basis for Cleanup Standards**

a. **General**: State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to this discharge and requires attainment of background levels of water quality, or the highest level of water quality which is reasonable if background levels of water quality cannot be restored. Cleanup levels other than background must be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in exceedance of applicable water quality objectives.

State Board Resolution No. 92-49, "Policies and Procedures for Investigation and

Cleanup and Abatement of Discharges Under Water Code Section 13304," applies to this discharge. This order and its requirements are consistent with the provisions of Resolution No. 92-49, as amended.

b. **Beneficial Uses**: The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23 CCR 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

Board Resolution No. 89-39, "Sources of Drinking Water," defines potential sources of drinking water to include all groundwater in the region, with limited exceptions for areas of high TDS, low yield, or naturally-high contaminant levels. Groundwater underlying and adjacent to the site qualifies as a potential source of drinking water.

The Basin Plan designates the following potential beneficial uses of groundwater underlying and adjacent to the site:

- o Municipal and domestic water supply
- o Industrial process water supply
- o Industrial service water supply
- o Agricultural water supply

At present time, there is no known current use of groundwater underlying the site for the above purposes.

c. **Basis for Groundwater Cleanup Standards**: The groundwater cleanup standards for the site are based on applicable water quality objectives and are the more stringent of the US EPA and California primary maximum contaminant levels (MCLs).

d. **Basis for Soil Cleanup Standards**: Soil cleanup standards for the site will be based on acceptable risk levels for public health and water quality.

13. **Basis for Non-Attainment Area**

a. **Limits of Groundwater Extraction Technology**: The Board has over ten years of experience overseeing the cleanup of petroleum and VOC-polluted groundwater at numerous Bay Area sites. The Board is also aware of experience elsewhere in the U.S. with such sites.

This experience demonstrates that groundwater extraction is an effective technology for pollutant removal and migration control. However, groundwater extraction is usually not effective in restoring beneficial uses of VOC-polluted groundwater, due to very stringent water quality objectives for many VOCs and due to prohibitively high costs and long time-frames required to reach objectives. Groundwater pollutant concentrations typically reach an asymptotic level that is significantly above the applicable water quality objective. These findings were also part of the Board's consideration of Basin Plan groundwater amendments in late 1992.

b. **Non-Attainment Area**: The Board may designate a non-attainment area for areas of groundwater where water quality objectives cannot reasonably be achieved, after considering what is technologically and economically feasible within a reasonable time period. Water quality objectives must continue to be met outside of the designated non-attainment area.

c. **Criteria**: In order to designate a non-attainment area, the Board considered whether:

i. The discharger has completed adequate source control (removed tanks, sumps, floating product, and other sources; removed or isolated polluted soils), and

ii. The discharger has fully implemented an approved groundwater cleanup program and groundwater concentrations have reached asymptotic levels, and

iii. No alternative to groundwater extraction is technically or economically feasible, and

iv. The discharger has evaluated the risks to water quality, human health, and the environment associated with the non-attainment area, and

v. The discharger has proposed a risk management plan to avoid excessive risk to water quality, human health, and the environment (including reasonable mitigation for any significant adverse impacts), and

vi. The discharger will conduct monitoring adequate to document that water quality objectives are met outside the non-attainment area and that risks within the non-attainment area remain acceptable.

d. **Specific Rationale**: Water quality objectives cannot reasonably be achieved in the area designated on Plate 4 (attached). The area meets the above criteria for designating non-attainment areas. Specifically, 1)Unocal has completed adequate source removal, no alternative

to groundwater extraction is technically or economically feasible, and will conduct monitoring adequate to document that water quality objectives are met outside the non-attainment area and that risks within the non-attainment area remain acceptable.

14. **Reuse or Disposal of Extracted Groundwater**: Board Resolution No. 88-160 allows discharges of extracted, treated groundwater from site cleanups to surface waters only if it has been demonstrated that neither reclamation nor discharge to the sanitary sewer is technically and economically feasible.

15. **Basis for 13304 Order**: The discharger has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into waters of the State and creates or threatens to create a condition of pollution or nuisance.

16. **Cost Recovery**: Pursuant to California Water Code Section 13304, the discharger is hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this order.

17. **CEQA**: This action is an order to enforce the laws and regulations administered by the Board. As such, this action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency Guidelines.

18. **Notification**: The Board has notified the discharger and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe site cleanup requirements for the discharge, and has provided them with an opportunity to submit their written comments.

19. **Public Hearing**: The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger (or its agents, successors, or assigns) shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous substances in a manner which will degrade water quality or adversely affect beneficial uses of waters of the State is prohibited.

2. Further significant migration of wastes or hazardous substances through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes or hazardous substances are prohibited.

B. CLEANUP PLAN AND CLEANUP STANDARDS

1. **Groundwater Cleanup Standards**: The following groundwater cleanup standards shall be met in all wells located outside the non-attainment area (as shown in Plate 4)

Constituent	Cleanup Standard (ug/l)	Basis
TPH-Gasoline	500	Risk Based Values
TPH-Diesel	500	Risk Based Values
Benzene	1	California's Primary MCL's

3. **Soil Cleanup Standards**: Soil cleanup has been completed.

C. NON-ATTAINMENT AREA

1. **Establishment of Area**: A non-attainment area is established as shown in Plate 5. Groundwater cleanup standards do not apply in this area. The discharger is required to implement the proposed risk management plan.

D. TASKS

1. PROPOSED INSTITUTIONAL CONSTRAINTS

COMPLIANCE DATE: June 15, 1996

Submit a technical report acceptable to the Executive Officer documenting procedures to be used by the discharger to prevent or minimize human exposure to soil and groundwater contamination prior to meeting cleanup standards. Such procedures shall include a deed restriction prohibiting

the use of shallow groundwater as a source of drinking water.

2. **IMPLEMENTATION OF INSTITUTIONAL CONSTRAINTS**

COMPLIANCE DATE: 60 days after Executive Officer approval

14. **Future Changes to Cleanup Standards or Non-Attainment Area**: The goal of this remedial action is to maintain or restore the beneficial uses of groundwater outside of the designated non-attainment area. If new technical information indicates that it is technologically and economically feasible to meet cleanup standards within all or a portion of the non-attainment area, then the Board may modify or rescind order 96-xxxx.

Submit a technical report acceptable to the Executive Officer documenting that the proposed institutional constraints have been implemented.

3. **SEMIANNUAL GROUNDWATER MONITORING REPORTS**

COMPLIANCE DATE: Every 6 months beginning June 15,1996

Submit Semiannual Groundwater Monitoring Reports, acceptable to the Executive Officer, beginning June 15, 1996. If a proposal is submitted to alter the monitoring schedule or alter the specific wells to be sampled, approval must be given by the Executive Officer.

4. **FIVE-YEAR STATUS REPORT**

COMPLIANCE DATE: August 30, 2001

Submit a technical report acceptable to the Executive Officer evaluating the effectiveness of the approved cleanup plan, including the designated non-attainment area. The report should include:

a. Summary of effectiveness in controlling contaminant migration and protecting human health and the environment

b. Comparison of contaminant concentration trends with cleanup standards

c. Evaluation of risk management plan associated with non-attainment area

5. **EVALUATION OF NEW HEALTH CRITERIA**

COMPLIANCE DATE: 90 days after requested by Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating the effect on the approved cleanup plan of revising one or more cleanup standards in response to revision of drinking water standards, maximum contaminant levels, or other health-based criteria.

6. **EVALUATION OF NEW TECHNICAL INFORMATION**

COMPLIANCE DATE: 90 days after requested by Executive Officer

Submit a technical report acceptable to the Executive Officer evaluating new technical information which bears on the approved cleanup plan and cleanup standards for this site. In the case of a new cleanup technology, the report should evaluate the technology using the same criteria used in the feasibility study. Such technical reports shall not be requested unless the Executive Officer determines that the new information is reasonably likely to warrant a revision in the approved cleanup plan or cleanup standards.

7. **Delayed Compliance**: If the discharger is delayed, interrupted, or prevented from meeting one or more of the completion dates specified for the above tasks, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

E. **PROVISIONS**

1. **No Nuisance**: The storage, handling, treatment, or disposal of polluted soil or groundwater shall not create a nuisance as defined in California Water Code Section 13050(m).

2. **Good O&M**: The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with the requirements of this Order.

3. **Cost Recovery**: The discharger shall be liable, pursuant to California Water Code Section 13304, to the Board for all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. If the site addressed by this Order is enrolled in a State Board-managed reimbursement program, reimbursement shall be made pursuant to this Order and according to the procedures established in that program. Any disputes raised by the discharger over reimbursement amounts or methods used in that program shall be consistent with the dispute resolution procedures for that program.

4. **Access to Site and Records**: In accordance with California Water Code Section

13267(c), the discharger shall permit the Board or its authorized representative:

a. Entry upon premises in which any pollution source exists, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

b. Access to copy any records required to be kept under the requirements of this Order.

c. Inspection of any monitoring or remediation facilities installed in response to this Order.

d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

5. **Self-Monitoring Program**: The discharger shall comply with the Self-Monitoring Program as attached to this Order and as may be amended by the Executive Officer.

6. **Contractor / Consultant Qualifications**: All technical documents shall be signed by and stamped with the seal of a California registered geologist, a California certified engineering geologist, or a California registered civil engineer.

7. **Lab Qualifications**: All samples shall be analyzed by State-certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control (QA/QC) records for Board review. This provision does not apply to analyses that can only reasonably be performed on-site (e.g. temperature).

8. **Document Distribution**: Copies of all correspondence, technical reports, and other documents pertaining to compliance with this Order shall be provided to the following agencies:

a. City and County of San Francisco Department of Public Health, Local Oversight Program

b. California Regional Water Quality Control Board, San Francisco Bay Region

The Executive Officer may modify this distribution list as needed.

9. **Reporting of Changed Owner or Operator**: The discharger shall file a technical report on any changes in site occupancy or ownership associated with the property described in this Order.

10. **Reporting of Hazardous Substance Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, the discharger shall report such discharge to the Regional Board by calling (510) 286-1255 during regular office hours (Monday through Friday, 8:00 to 5:00).

A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

This reporting is in addition to reporting to the Office of Emergency Services required pursuant to the Health and Safety Code.

11. **Periodic SCR Review**: The Board will review this Order periodically and may revise it when necessary.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on April 17, 1996.

Loretta K. Barsamian

Executive Officer

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FAILURE TO COMPLY WITH THE REQUIREMENTS OF THIS ORDER MAY SUBJECT YOU TO ENFORCEMENT ACTION, INCLUDING BUT NOT LIMITED TO: IMPOSITION OF ADMINISTRATIVE CIVIL LIABILITY UNDER WATER CODE SECTIONS 13268 OR 13350, OR REFERRAL TO THE ATTORNEY GENERAL FOR INJUNCTIVE RELIEF OR CIVIL OR CRIMINAL LIABILITY

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Attachments: (Plate 1-4)

Self-Monitoring Program

PLATE 1

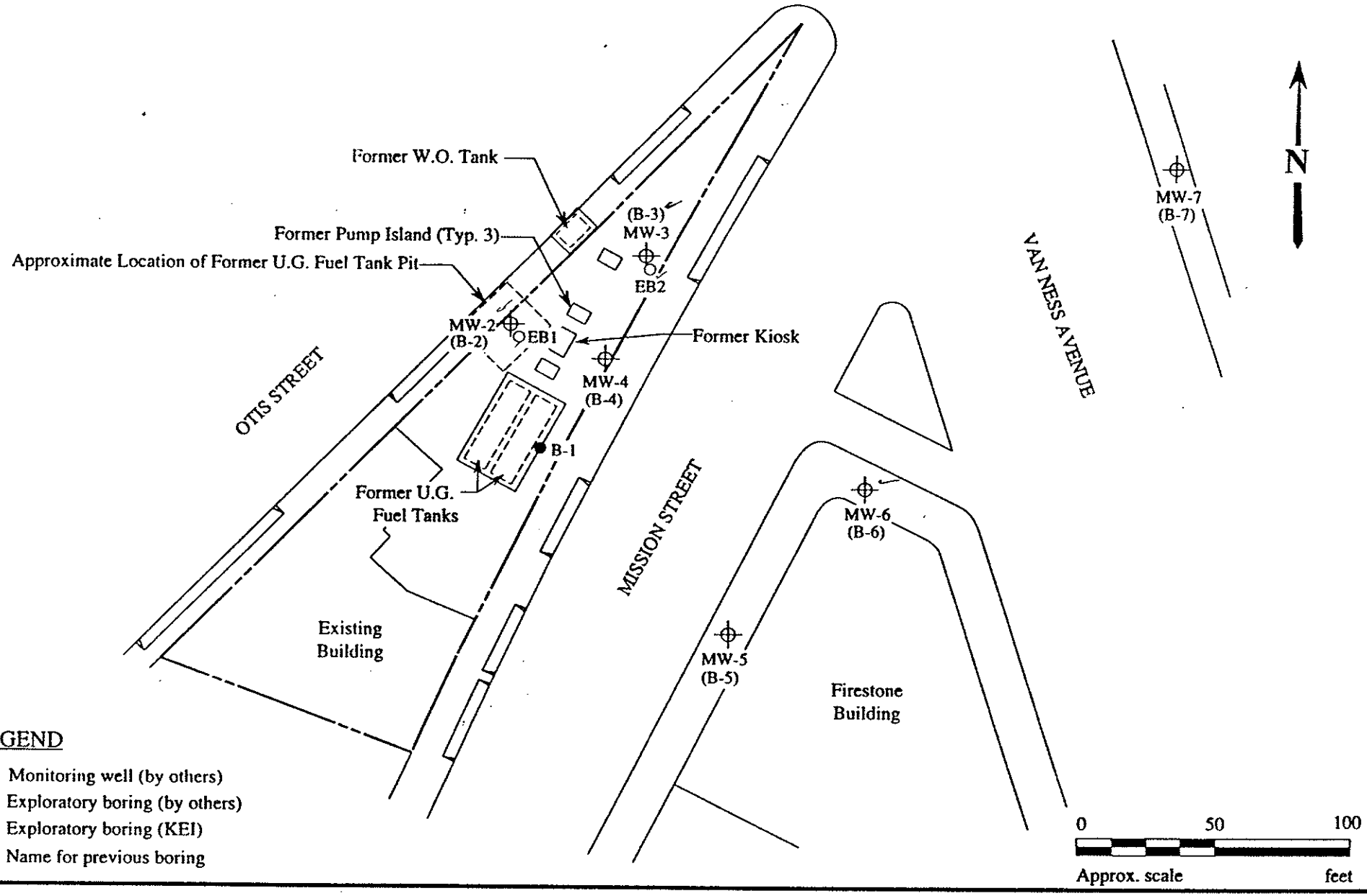
Base modified from 7.5 minute U.S.G.S. San Francisco North Quadrangle
(photorevised 1973)

0 2000 4000
Approx. scale feet

KAPREALIAN ENGINEERING
INCORPORATED

FORMER UNOCAL S/S #5455
1600 MISSION STREET
SAN FRANCISCO, CALIFORNIA

LOCATION MAP



EXPLORATORY BORING AND MONITORING WELL LOCATION MAP

KAPREALIAN ENGINEERING
CORPORATED

FORMER UNOCAL S/S #5455
1600 MISSION STREET
SAN FRANCISCO, CALIFORNIA

PLATE 2

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
9/27/95	MW2	2,200	ND	ND	38	ND
	MW3	11,000	160	ND	120	ND
	MW4	4,500	11	ND	160	270
	MW5	ND	ND	ND	ND	ND
	MW6	WELL WAS INACCESSIBLE				
	MW7	ND	ND	ND	ND	ND
6/23/95	MW2	WAS WAS INACCESSIBLE				
	MW3	10,000	200	36	160	77
	MW4	2,300	660	ND	62	130
	MW5	ND	ND	ND	ND	ND
	MW6	WELL WAS INACCESSIBLE				
	MW7	WELL WAS DRY				
3/20/95	MW2	3,800	ND	2.1	62	4.7
	MW3	13,000	250	23	130	31
	MW4	250	ND	1.6	ND	1.6
	MW5	ND	ND	ND	ND	1.1
	MW6	76	ND	2.1	ND	3.0
	MW7	ND	ND	1.7	ND	2.4
12/15/94	MW2	6,400	ND	110	ND	ND
	MW3	11,000	180	17	77	57
	MW4	990	3.9	ND	ND	4.2
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
9/21/94	MW2	WELL WAS INACCESSIBLE				
	MW3	11,000	360	50	8.5	36
	MW4	1,700	10	ND	14	12
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND

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PLATE 3

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
6/29/94	MW2	4,400	ND	ND	32	7.4
	MW3	11,000	300	24	89	29
	MW4	2,800	5.0	ND	19	3.4
	MW5	ND	ND	ND	ND	ND
	MW6	74	0.99	0.72	ND	0.87
	MW7	ND	ND	ND	ND	ND
3/25/94	MW2	WELL WAS INACCESSIBLE				
	MW3	13,000	350	17	72	19
	MW4	4,900	31	ND	ND	ND
	MW5	ND	ND	ND	ND	ND
	MW6	120	0.74	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
12/27/93	MW2	WELL WAS INACCESSIBLE				
	MW3	10,000	750	190	180	190
	MW4	3,200	300	34	15	34
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	WELL WAS DRY				
9/28/93	MW2	3,900	ND	ND	55	4.0
	MW3	11,000	490	27	130	ND
	MW4	4,200	23	ND	ND	ND
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	NOT SAMPLED				
6/24/93	MW2	3,100	ND	ND	36	ND
	MW3	14,000	590	51	120	70
	MW4	2,500	16	ND	31	ND
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	WELL WAS INACCESSIBLE				

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PLATE 3

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
3/30/93	MW2	21,000	9.8	5.8	160	5.8
	MW3	47,000	1,000	88	240	14
	MW4	8,700	28	0.8	140	1.2
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	WELL WAS INACCESSIBLE				
11/19/92	MW2	4,600	ND	3.4	24	8.2
	MW3	43,000	950	30	92	67
	MW4	12,000	54	6.5	32	14
	MW5	NOT SAMPLED				
	MW6	ND	ND	ND	ND	ND
	MW7	WELL WAS INACCESSIBLE				
9/11/92	MW2	4,500	3.1	2.5	25	8.6
	MW3	36,000	1,400	43	120	120
	MW4	7,700	120	5.0	15	11
	MW5	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND
	MW7	WELL WAS INACCESSIBLE				
5/20/92	MW2	7,900	1.7	3.1	35	9.8
	MW3	49,000	1,600	55	140	730
	MW4	17,000	180	6.6	53	17
	MW5	ND	ND	ND	ND	ND
	MW6	480	ND	1.6	1.5	3.6
	MW7	NOT SAMPLED				
2/20/92	MW2	8,400	ND	3.5	29	9.7
	MW3	47,000	930	77	160	51
	MW4	38,000	290	5.7	390	250
	MW5	NOT SAMPLED				
	MW6	1,600	ND	3.3	2.6	5.9
	MW7	NOT SAMPLED				

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PLATE 3

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
11/21/91	MW2	4,000	ND	ND	16	9.5
	MW3	27,000	1,600	35	120	97
	MW4	15,000	330	ND	200	130
	MW5	ND	ND	ND	ND	ND
	MW6	820	ND	ND	3.7	11
	MW7	NOT SAMPLED				
8/29/91	MW2	3,000	5.4	3.8	25	11
	MW3	15,000	580	25	180	78
	MW4	14,000	370	11	450	300
	MW5	ND	ND	ND	ND	ND
	MW6	330	ND	3.2	2.3	5.1
	MW7	NOT SAMPLED				
5/22/91	MW2	7,000	4.8	4.6	69	21
	MW3	20,000	89	34	170	110
	MW4	17,000	260	3.4	71	340
	MW5	ND	ND	ND	ND	ND
	MW6	850	ND	2.1	2.1	5.3
	MW7	NOT SAMPLED				
2/20/91	MW2	1,800	7.9	7.1	21	18
	MW3	12,000	81	30	260	140
	MW4	18,000	380	77	670	2,400
	MW5	ND	ND	ND	ND	ND
	MW6	260	ND	1.1	1.1	2.2
	MW7	NOT SAMPLED				
12/06/90	MW2	2,200	2.8	5.8	33	16
	MW3	6,600	63	6.7	120	53
	MW4	6,900	240	5.6	350	510
	MW5	ND	ND	ND	ND	ND
	MW6	200	ND	ND	1.4	4.0
	MW7	ND	ND	ND	ND	ND

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PLATE 3

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
8/15/90	MW2	3,400	ND	5.1	25	12
	MW3	13,000	64	23	150	72
	MW4	10,000	140	12	160	170
	MW5	ND	ND	ND	ND	ND
	MW6	740	ND	4.7	5.2	9.8
	MW7	ND	ND	ND	ND	ND
4/16/90	MW2	3,400	ND	4.0	29	24
	MW3	15,000	17	24	310	99
	MW4	8,100	99	6.3	34	170
	MW5	ND	ND	ND	ND	ND
	MW6	1,000	ND	5.0	4.8	11
	MW7	ND	ND	ND	ND	ND
1/05/90	MW2	4,300	61	50	37	43
	MW3	13,000	51	18	320	55
	MW4	6,800	100	11	19	29
	MW5	NOT SAMPLED				
	MW6	520	ND	2	1.1	4.3
	MW7	NOT SAMPLED				
10/05/89	MW2	WELL WAS INACCESSIBLE				
	MW3	14,000	37	20	490	150
	MW4	6,100	93	5.1	26	11
	MW5	NOT SAMPLED				
	MW6	210	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND
6/08/89	MW2	5,500	11	3.5	92	91
	MW3	WELL WAS INACCESSIBLE				
	MW4	7,200	160	3.3	68	55
	MW5	ND	ND	ND	ND	ND
	MW6	330	ND	8	0.7	12
	MW7	27	ND	ND	ND	ND

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PLATE 3

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
2/22/89	MW2	NOT SAMPLED				
	MW3	NOT SAMPLED				
	MW4	NOT SAMPLED				
	MW5	ND	ND	ND	ND	ND
	MW6	NOT SAMPLED				
	MW7	ND	ND	ND	ND	ND
12/21/88	MW2	12,470	24	2	231	414
	MW3	26,000	92	6	1,468	898
	MW4	5,620	45	3	15	23
	MW5	ND	ND	ND	ND	ND
	MW6	720	1.6	1.5	8.3	18.3
	MW7	ND	ND	0.7	1.4	0.8
8/19/88	MW2	4,000	26	5	286	338
	MW3	19,100	141	17	1,184	2,486
	MW4	4,400	125	9	26	ND
	MW5	ND	ND	ND	ND	ND
	MW6	670	4.8	ND	14.5	12.0
	MW7	ND	ND	ND	ND	ND
3/28/88	MW2	4,300	23	3	159	602
	MW3	15,800	138	16	2,114	1,100
	MW4	7,500	888	40	482	180
	MW5	ND	ND	0.6	ND	0.7
	MW6	2,900	23	10	9	15
	MW7	ND	ND	ND	ND	ND
10/09/87	MW2	13,170*	140	20	470	2,150
	MW3	14,620*	530	40	1,830	720
	MW4	6,905*	2,176	6	210	266

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PLATE 3

Former Unocal Service Station #5455
1600 Mission Street
San Francisco, California

TABLE 7 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

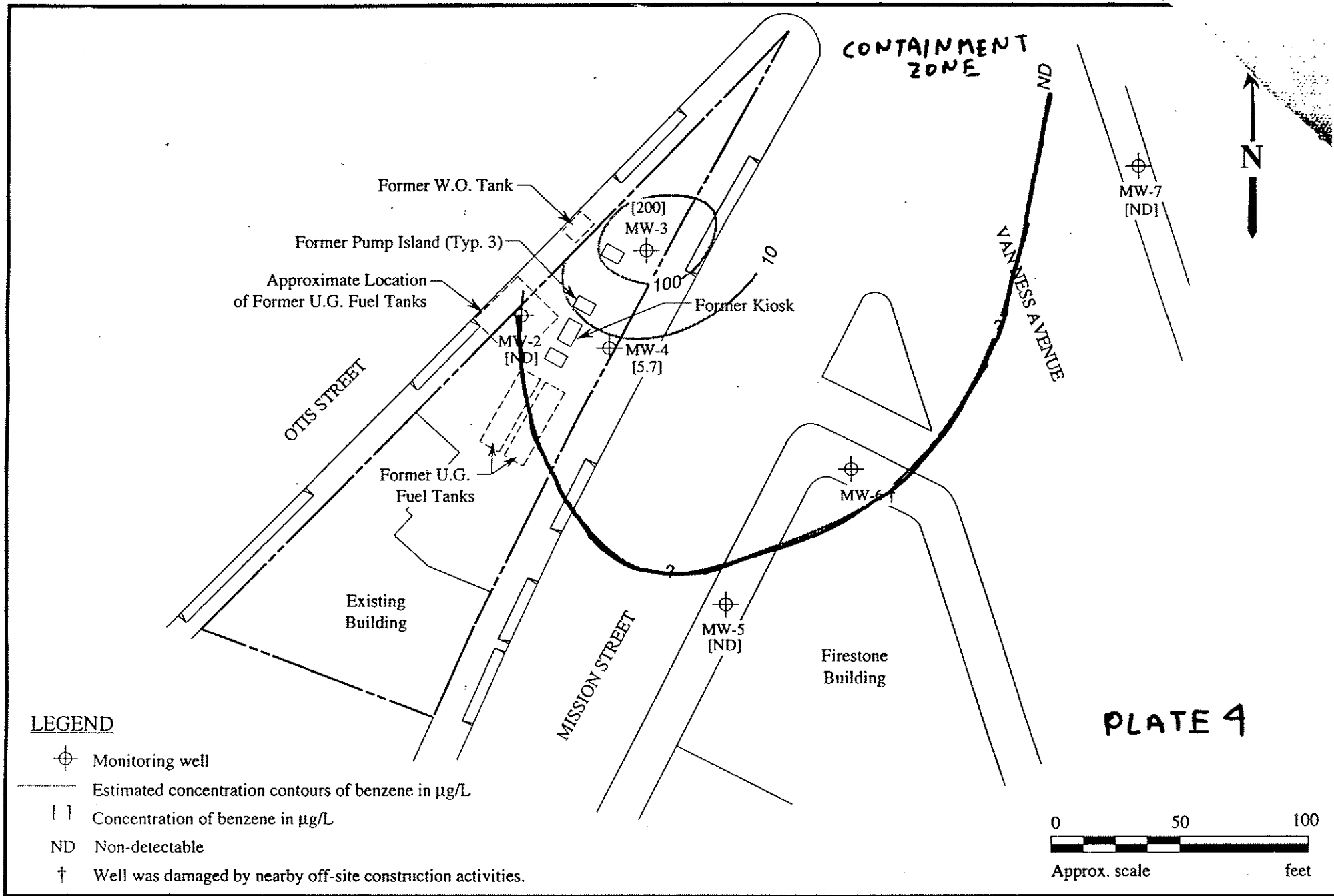
* Analyzed for total volatile hydrocarbons by EPA Method 602.

ND = Non-detectable.

Results are in micrograms per liter (µg/L), unless otherwise indicated.

NOTE: Laboratory analyses data prior to December 27, 1993, were provided by RESNA.

PLATE 3



PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON DECEMBER 29, 1995

KAPREALIAN ENGINEERING
INCORPORATED

FORMER UNOCAL S/S #5455
1600 MISSION STREET
SAN FRANCISCO, CALIFORNIA

FIGURE
2

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM FOR:

Former Unocal Service Station #5455

for the property located at

1600 Mission Avenue, San Francisco,

San Francisco County

1. **Authority and Purpose**: The Board requests the technical reports required in this Self-Monitoring Program pursuant to Water Code Sections 13267 and 13304. This Self-Monitoring Program is intended to document compliance with Board Order No. 96-051(site cleanup requirements).

2. **Monitoring**: The discharger shall measure groundwater elevations quarterly in all monitoring wells, and shall collect and analyze representative samples of groundwater according to the following table:

Well #	Sampling Frequency	Analyses	Well #	Sampling Frequency	Analyses
MW-2	SA	8015/8020	MW-7	SA	8015/8020
MW-3	SA	8015/8020			
MW-4	SA	8015/8020			
MW-4	SA	8015/8020			
MW-6	SA	8015/8020			

Key: Q = Quarterly 8010 = EPA Method 8010 or equivalent
SA = Semi-Annually 8020 = EPA Method 8020 or equivalent
A = Annually 8240 = EPA Method 8240 or equivalent
8010/8240 = EPA Method 8240 in lieu of 8010 for fourth quarter

The discharger shall sample any new monitoring or extraction wells quarterly and analyze groundwater samples for the same constituents as shown in the above table. The discharger may propose changes in the above table; any proposed changes are subject to Executive Officer approval.

3. **Semiannual Monitoring Reports**: The discharger shall submit semiannual monitoring reports to the Board no later than 30 days following the end of the semiannual period (e.g. report for first semiannual period of the year due June 30). The first semiannual monitoring report shall be due on June 30, 1996. The reports shall include:

a. Transmittal Letter: The transmittal letter shall discuss any violations during the reporting period and actions taken or planned to correct the problem. The letter shall be signed by the discharger's principal executive officer or his/her duly authorized representative, and shall include a statement by the official, under penalty of perjury, that the report is true and correct to the best of the official's knowledge.

b. Groundwater Elevations: Groundwater elevation data shall be presented in tabular form, and a groundwater elevation map should be prepared for each monitored water-bearing zone. Historical groundwater elevations shall be included in the fourth quarterly report each year.

c. Groundwater Analyses: Groundwater sampling data shall be presented in tabular form, and an isoconcentration map should be prepared for one or more key contaminants for each monitored water-bearing zone, as appropriate. The report shall indicate the analytical method used, detection limits obtained for each reported constituent, and a summary of QA/QC data. Historical groundwater sampling results shall be included in the fourth quarterly report each year. The report shall describe any significant increases in contaminant concentrations since the last report, and any measures proposed to address the increases. Supporting data, such as lab data sheets, need not be included (however, see record keeping - below).

d. Groundwater Extraction: If applicable, the report shall include groundwater extraction results in tabular form, for each extraction well and for the site as a whole, expressed in gallons per minute and total groundwater volume for the quarter. The report shall also include contaminant removal results, from groundwater extraction wells and from other remediation systems (e.g. soil vapor extraction), expressed in units of chemical mass per day and mass for the quarter. Historical mass removal results shall be included in the fourth quarterly report each year.

e. Status Report: The quarterly report shall describe relevant work completed during the reporting period (e.g. site investigation, interim remedial measures) and work planned for the following quarter.

5. **Violation Reports**: If the discharger violates requirements in the Site Cleanup Requirements, then the discharger shall notify the Board office by telephone as soon as practicable once the discharger has knowledge of the violation. Board staff may, depending on violation severity, require the discharger to submit a separate technical report on the violation within five working days of telephone notification.

6. **Other Reports**: The discharger shall notify the Board in writing prior to any site activities, such as construction or underground tank removal, which have the potential to cause further migration of contaminants or which would provide new opportunities for site investigation.

7. **Record Keeping**: The discharger or his/her agent shall retain data generated for the above reports, including lab results and QA/QC data, for a minimum of six years after origination and shall make them available to the Board upon request.

8. **SMP Revisions**: Revisions to the Self-Monitoring Program may be ordered by the Executive Officer, either on his/her own initiative or at the request of the discharger. Prior to making SMP revisions, the Executive Officer will consider the burden, including costs, of associated self-monitoring reports relative to the benefits to be obtained from these reports.

I, Loretta K. Barsamian, Executive Officer, hereby certify that this Self-Monitoring Program was adopted by the Board on April 17, 1996.

Loretta K. Barsamian
Executive Officer